



NASA SBIR Select 2012 Phase I Solicitation

E2.01 Air Traffic Management Research and Development

Lead Center: ARC

Participating Center(s): LaRC

The Airspace Systems Program (ASP) seeks innovative and feasible concepts and technologies to enable significant increases in the capacity and efficiency of the Next Generation Air Transportation System (NEXTGEN) while maintaining or improving safety and environmental acceptability. The Concepts and Technology Development (CTD) Project develops gate-to-gate concepts and technologies for NextGen to enable significant increases in capacity and efficiency. The Systems Analysis, Integration and Evaluation (SAIE) Project facilitates R&D maturation of integrated concepts and technologies through evaluation in relevant environments, enabling transition to stakeholders. The research will result in evaluations of integrated automation technologies and procedures designed to address the following technical challenges:

- Develop Tactical Automation Technologies for Complex Operational Choke Points Including Surface, Arrival/Departure, and Dense Terminal Operations.
- Establish the basis for air/ground functional allocation for separation assurance including safe, graceful degradation of performance in response to off-nominal conditions.
- Develop strategic automation technologies that integrate probabilistic weather information and flow management capabilities.
- Conduct seamless integration of automation applications in a resilient, end-to-end Trajectory-Based Operations system.
- For the highest levels of NextGen performance and beyond, develop concepts, technologies, and system-wide evaluation and validation approaches.

In support of these technical challenges, ASP is seeking specific SBIR proposals in these two areas of interest:

- Integrated arrival, departure, and surface traffic planning for reduced fuel consumption, noise, and emissions during congested flows through:
 - Balanced runway usage and runway configuration management.
 - Optimized taxi planning of departures and arrivals.
 - Precision departure release scheduling.
 - Reduced fuel/noise/emissions continuous descent arrivals with precision scheduling.
 - Maintaining safety in ground operations through the development of concepts and algorithms for both aircraft- and ground-based surface conflict detection and resolution (CD&R) and integration of the two approaches.
 - Developing pilot display requirements and technologies for 4D taxi clearance compliance, and taxi clearance conformance monitoring algorithms and procedures.
 - Dynamic wake vortex separation criteria. Environmental impacts will be considered as concepts are investigated.

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- Develop a tool for air traffic management cost assessment:
 - Aircraft line of flight impact to the airline and the NAS;
 - Quantify user costs on equipage and training along with benefits delivered by the related new concepts and capabilities;
 - Economic impact of policy decisions for new procedures on given concepts and technologies